PP comments on request for review of ESTRE Pedreira Landfill Gas Project

Reason for request:

1. ***Further demonstration of the additionality of the project activity is required;***

   According to the Ministério da Ciência e Tecnologia[1] (Brazilian Ministry of Science and Technology), "There is no data related to the methane recovery in Brazil, although it is possible to affirm that there are very few solid waste final disposal sites where the methane extraction is possible." and, "Anyway, the recovery is unknown and it is known that, when it happens, this extraction amount is insignificant".

   Presently, as written in the ESTRE Pedreira Project Design Document, methane recovery is not mandatory for landfills in Brazil and the cost of capturing the methane and investing in electricity generation is not economically feasible as a baseline scenario. The fact of the majority of the waste in Brazil (72%) is disposal at sites which are not at the level of sanitary landfill (see Table 1).

Table 1. Districts with waste collection services, by final waste destination unit, according to the Geographical Regions and Federation Units - 2000

Geographical Regions and Federation Units	Districts with waste collection services								
	Total	Units of collected waste final destination							
		Open Dump	Open dumps in Flooded Areas	Controlled Landfill	Sanitary Landfill	Special Waste Landfill	Composting	Recycling	Incineration
Brazil	*8.381*	*5.993*	*63*	*1.868*	*1.452*	*810*	*260*	*596*	*325*
North	512	488	8	44	32	10	1	0	4
Rondônia	54	50		7	3				
Acre	22	17		2	4	1			
Amazonas	71	60	2	11	4	1			3
Roraima	15	15							
Pará	183	191	5	11	17	5	1		0
Amapá	23	23	1						1
Tocantins	144	132		13	4	3			
Northeast	2.714	2.538	7	169	134	69	19	28	7
Maranhão	204	199	1	11	2	18	2	1	4
Piaui	217	212	3	11	3	2			
Ceará	551	512	1	16	62	1			
Rio Grande do Norte	171	158	2	17	5	2	1	2	
Paraíba	268	264		2	5	7	8	4	1
Pernambuco	359	329		43	15	8	5	12	1
Alagoas	113	107		9	1	6	1	2	
Sergipe	80	65		21	2	4			
Bahia	751	692		39	39	21	2	7	1
Southeast	2.846	1.713	36	785	683	483	117	198	210
Minas Gerais	1.396	1.153	17	293	97	108	56	52	50
Espírito Santo	236	133		66	66	31	1	8	10
Rio de Janeiro	273	199	7	92	61	61	22	42	6
São Paulo	941	228	12	334	459	283	38	96	144
South	1.746	848	11	738	478	219	117	351	101
Paraná	619	402	4	210	134	142	12	43	4
Curitiba	1				1	1			1
Santa Catarina	376	199	2	130	107	26	19	52	29
Rio Grande do Sul	751	247	5	398	237	51	86	256	68

[1] Emissões de Metano no Tratamento e na Disposição de Resíduos (Methane Emissions from Waste Disposal and Treatment) - Primeiro Inventário Brasileiro de Emissões Antrópicas de Gases de Efeito Estufa (First Brazilian GHG Emissions Inventory) – Relatórios de Referência, Ministério da Ciência e Tecnologia, 2006, Brasil;

Mid-West	563	406	1	132	125	29	6	19	3
Mato Grosso do Sul	118	91	1	39	18	1		10	
Mato Grosso	158	124		35	13	7	5	4	1
Goiás	286	191		57	94	20		4	1
Distrito Federal	1			1		1	1	1	1

Source: IBGE, Diretoria de Pesquisas, Departamento de População e Indicadores Sociais, Pesquisa Nacional de Saneamento Básico 2000.
Note: one same district might have more than one final destination of waste collected.
Note: This table was adapted from the original table from PNSB

According to CDM pipeline[2], in Brazil there are 7 CDM landfill projects with power generation. All the others (20 projects) consist in methane flaring only. It is possible to conclude that, even with the CERs revenue incentive, the power generation with landfill gas is not a common practice in Brazil.

One reason for the small quantity of landfill power generation is the lack of technical expertise in the country. As there was so far just little research on this subject in Brazil, the companies that decide to use this kind of technology, will preferably buy the equipments from companies based in United States or Europe, and train the work labor to operate the system.

Another reason is the high investment costs estimated for biogas collection for power generation. If a project implements only the biogas collection and flaring system, the costs (not including the Brazilian taxes, transport and other services) are estimated to be around € 700,000.00 for this project. The real costs were considered confidential and were submitted to the DNV team.

Effective methane recovery for electricity generation can be achieved at sanitary landfills, but only with significant investments. From our experience, the cost involved in the implementation of a power generation system (out of the needed biogas collection system) is estimated to be also around € 770.000,00[3] per MW of installed capacity.

In Table 2 below, it can be noted that the estimated costs involved in installing the collection system and a 4 MW power generation are very high and, as demonstrated above, such projects are only being pursued in conjunction with the support of CER revenues.

Table 2. Estimated costs for a similar biogas collection and power generation system

Power generation group	1,715,261.68 €
Electric panels	377,926.79 €
Power transformers	51,976.04 €
Sound attenuators	40,066.72 €
Electromechanical installations	611,274.01 €
Transport	54,914.16 €
Insurance	18,326.19 €
Emergency power generation group	4,922.25 €

[2] CDM Pipeline overview updated 1st October 2007, Capacity Development for the Clean Development Mechanism – CD4CDM, available at http: www.cd4cdm.org.

[3] Market data and Master Thesis – Diagnóstico técnico institucional da recuperação e uso energético do biogás gerado pela digestão anaeróbica de resíduos , João Wagner Silva Alves , São Paulo, 2000;

Filters	210,811.65 €
Total Power Generation system 4 MW Installed capacity	**3,085,479.51 €**
Biogas collection and backup flare	993,268.96 €
Total Power Generation + biogas collection and backup flare	**4,078,748.47 €**

In addition, there is a lack of funding in Brazil. CNI[4] says that "...the bank loans are expensive; the payments are in short terms and not enough to supply the market. The capital market is not very developed, restricting the shares sells and others bonds directly to investors. And external financing, in the last years, has been oscillating in payment terms and costs, also being an unstable resource". Furthermore, to get the loans, companies underwent through lot of bureaucracy, and the whole process could last months.

As showed above, it is reasonable to conclude that the lack of technical expertise, the high investment costs and the lack of funding make the landfill power generation not a plausible scenario. Thus, the only plausible scenario is the continuation of the actual scenario (no active methane collection and flaring).

2. *The simple cost analysis scenario is applied. Further evidence to substantiate the analysis should be provided;*

More detailed estimated costs are presented in the table below:

Table 3 – Estimated costs for Operation and Implementation of EPLGP

	2007	2008	2009	2010	2011	2012	2013	2014	2015	
Engineering costs	150,000 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	
Equipments costs	600,000 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	
Implementation costs	750,000 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	0 €	Total
Maintenance	30,000 €	30,000 €	30,000 €	30,000 €	30,000 €	30,000 €	30,000 €	30,000 €	30,000 €	
Labor costs	49,846 €	49,846 €	49,846 €	49,846 €	49,846 €	49,846 €	49,846 €	49,846 €	49,846 €	
Electricity costs	88,846 €	88,846 €	88,846 €	88,846 €	88,846 €	88,846 €	88,846 €	88,846 €	88,846 €	
Operational costs	28,115 €	168,692 €	168,692 €	168,692 €	168,692 €	168,692 €	168,692 €	168,692 €	140,577 €	
Total costs	778,115 €	168,692 €	168,692 €	168,692 €	168,692 €	168,692 €	168,692 €	168,692 €	140,577 €	2,099,538 €

Also, the evidence of the implementation costs was sent to the validation team.

3. *Version 3 of the Tool for the demonstration and assessment of additionality should be applied;*

The new version of the PDD will apply the version 3 of the "Tool for the demonstration and assessment of additionality".

4. *The DOE shall further clarify how they have clarified the non-existence of local regulations in relation to the proposed activity of the project activity, as they state in page 11 of 48 of Validation Report "DNV was able to*

[4] Financiamento no Brasil – Desafio ao Crescimento, CNI – Confederação Nacional da Indústria, Brasilia, 2003.

confirm that possible future legislation that would require landfills to quantify and flare a certain amount of the gas produced is not likely to be implemented in near future, considering the waste disposition situation in Brazil". In addition, the DOE should clarify what they understand precisely as "not likely";

This question will be answered by DNV.

5. *"Since the Brazilian landfill regulations do not mandate LFG collection and destruction and only a small amount of the methane generated is currently burned due to safety and odour reasons, an "Adjustment Factor" of 20% is deemed appropriate". The DOE shall further clarify how they have validated the Adjustment Factor of 20% and how they determined that the level adopted is appropriate and, as required by the methodology, the adjustment factor applied should be clearly justified;*

   This question will be answered by DNV.

6. *The reference to the economic and financial hurdles of the project in the Validation Report should be substantiated with further evidence;*

   This question will be answered by DNV.

7. *Investment information provided shall be included in the valid PDD version. In addition, editorial review should be practiced in the final version of the PDD;*

   This information will be included in the PDD.

8. *The PP/DOE shall clarify whether the pressure and temperature measuring instruments are independent or the flow meter measures both temperature and pressure;*

   To ensure the data quality, both systems will be installed. There will be a flow meter that measures temperature and pressure and independent pressure and temperature meters, used as backup meters.

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